



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/841,301	04/24/2001	Scott Lee Wellington	5659-01800 TH1942	4730

7590 01/15/2003

DEL CHRISTENSEN
SHELL OIL COMPANY
P.O. BOX 2463
HOUSTON, TX 77252-2463

EXAMINER

KRECK, JOHN J

ART UNIT

PAPER NUMBER

3673

DATE MAILED: 01/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/841,301

Applicant(s)

WELLINGTON ET AL.

Examiner

John Kreck

Art Unit

3673

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address.

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 October 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1608-1685 and 5396-5412 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1608-1685 and 5396-5412 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 October 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.101(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 16, 18. 6) ☐ Other:

Art Unit: 3673

DETAILED ACTION

The amendment dated 10/31/02 has been entered.

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 1932 (Fed. Cir. 1915); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1907); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1892); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1891).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1916, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1608-1685 and 5396-5412 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over copending applications (including the present application): 09/840,936; 09/840,937; 09/841,000; 09/841,060; 09/841,061; 09/841,127; 09/841,128; 09/841,129; 09/841,130; 09/841,131; 09/841,170; 09/841,193; 09/841,194; 09/841,195; 09/841,238; 09/841,239; 09/841,240; 09/841,283; 09/841,284; 09/841,285; 09/841,286; 09/841,287; 09/841,288; 09/841,289; 09/841,290; 09/841,291; 09/841,292; 09/841,293; 09/841,294; 09/841,295; 09/841,296; 09/841,297; 09/841,298; 09/841,299; 09/841,300; 09/841,301; 09/841,302; 09/841,303; 09/841,304; 09/841,305; 09/841,306; 09/841,307; 09/841,308; 09/841,309; 09/841,310; 09/841,311; 09/841,312; 09/841,429; 09/841,430; 09/841,431; 09/841,432; 09/841,433; 09/841,434; 09/841,435; 09/841,436; 09/841,437; 09/841,438; 09/841,439; 09/841,440; 09/841,441; 09/841,442; 09/841,443; 09/841,444; 09/841,445; 09/841,446; 09/841,447; 09/841,448; 09/841,449; 09/841,488; 09/841,489; 09/841,490; 09/841,491; 09/841,492; 09/841,493; 09/841,494; 09/841,495; 09/841,496; 09/841,497; 09/841,498; 09/841,499; 09/841,500; 09/841,501; 09/841,502; 09/841,632; 09/841,633; 09/841,634; 09/841,635; 09/841,636; 09/841,637; 09/841,638; and 09/841,639.

Although the conflicting claims are not identical, they are not patentably distinct from other. At least one other application includes a set of claims which are

Art Unit: 3673

substantially identical to the claims in this application; but which call for coal containing formation rather than hydrocarbon. Since applicant has defined hydrocarbon containing formation as including coal; this would be an obvious variation.

37 CFR 1.78(b) provides that when two or more applications filed by the same applicant contain conflicting claims, elimination of such claims from all but one application may be required in the absence of good and sufficient reason for their retention during pendency in more than one application. The discussion below sets forth the Office's basis for its determination that each of these ninety one applications contains at least one claim that conflicts with another one of the related co-pending applications identified above. Each of these ninety one applications includes the same specification and collectively these ninety one applications present over five thousand claims. The Office has shown that each of these ninety one applications contains at least one claim that conflicts with another one of the related co-pending applications identified above, and an analysis of each of five thousand claims in the ninety one related co-pending applications would be an extreme burden on the Office requiring tens of thousands of claim comparisons. Therefore, the Office is requiring applicant to resolve the conflict between these applications and comply with 37 CFR 1.78(b) by either:

- (1) filing a terminal disclaimer in each of the related ninety-one applications terminally disclaiming each of the other ninety applications; or,
- (2) provide a statement that all claims in the ninety applications have been reviewed by applicant and that no conflicting claims exist between the

Art Unit: 3673

applications. Such a statement must set forth factual information to identify how all the claims in the instant application are distinct and separate inventions from all the claims in the above identified ninety applications.

See MPEP 804.02 IV for a discussion of multiple double patenting rejections and the requirements for a single terminal disclaimer.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Objections

3. Claim 5412 objected to because of the following informalities: it is questioned whether "heat sources" should be "heaters". Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1608, 1610, 1613, 1614, 1618, 1634, 1641-1643, 1647, 1649, 1652, 1653, 1657, 1673, 1680-1682, 5398, 5399, 5400, 5401, 5403, 5404, and 5408 are

Art Unit: 3673

rejected under 35 U.S.C. 102(b) as being anticipated by Tsai, et al. (U.S. Patent number 4,299,285).

4. The Tsai reference teaches a method for treating a coal formation in situ comprising providing heat from one or more heaters to a portion of the formation; allowing heat to transfer, and producing a mixture as called for in claim 1608. Although the Tsai reference fails to explicitly disclose the atomic hydrogen weight percentage greater than about 4%; this is inherent feature of bituminous coal (bituminous coal is taught in col. 1, line 7 of Tsai, et al.) as shown in table 2.5 and figure 2.9 of "Coalbed Methane".

With regards to claim 1610; the Tsai reference teaches a pyrolysis temperature range within a section of the formation (see col. 4, line 54).

With regards to claim 1613; the Tsai reference teaches a flameless combustor (see col. 2, line 32).

With regards to claim 1614; the Tsai reference teaches a natural distributed combustor (see col. 2, line 32).

With regards to claim 1618; the Tsai reference does not explicitly teach the transferring by conduction; however this is inherent in a solid substance such as coal. Even though the bulk of the heating in the Tsai method may be done by convection; it is apparent that some unfractured coal must remain, and thus the allowing heat to transfer comprises transferring heat substantially by conduction (that is, substantially within the unfractured portions).

Art Unit: 3673

With regards to claim 1634, the Tsai reference teaches the pressure greater than 2.0 bar.

With regards to claims 1641 and 1642; the Tsai reference teaches the permeability greater than about 100 md in table 1. The uniform increase in permeability is inherent.

With regards to claim 1643, although the Tsai reference fails to explicitly disclose a Fischer Assay; it is apparent that the disclosed process will yield greater than 60%.

With regards to claim 5398; Tsai teaches the pyrolysis zone.

Regarding independent claim 1647:

5. The Tsai reference teaches a method for treating a coal formation in situ comprising providing heat from one or more heaters to a portion of the formation; allowing heat to transfer, and producing a mixture as called for in claim 1647. Although the Tsai reference fails to explicitly disclose the atomic hydrogen weight percentage greater than about 4%; this is inherent feature of bituminous coal (bituminous coal is taught in col. 1, line 7 of Tsai, et al.) as shown in table 2.5 and figure 2.9 of "Coalbed Methane".

6. With regards to claim 1649; the Tsai reference teaches a pyrolysis temperature range within a section of the formation (see col. 4, line 54).

With regards to claim 1652; the Tsai reference teaches a flameless combustor (see col. 2, line 32).

Art Unit: 3673

With regards to claim 1653; the Tsai reference teaches a natural distributed combustor (see col. 2, line 32).

With regards to claim 1657; the Tsai reference does not explicitly teach the transferring by conduction; however this is inherent in a solid substance such as coal. Even though the bulk of the heating in the Tsai method may be done by convection; it is apparent that some unfractured coal must remain, and thus the allowing heat to transfer comprises transferring heat substantially by conduction (that is, substantially within the unfractured portions).

With regards to claim 1673, the Tsai reference teaches the pressure greater than 2.0 bar.

With regards to claims 1680 and 1681; the Tsai reference teaches the permeability greater than about 100 md in table 1. The uniform increase in permeability is inherent.

With regards to claim 1682, although the Tsai reference fails to explicitly disclose a Fischer Assay; it is apparent that the disclosed process will yield greater than 60%.

With regards to claim 5399; Tsai teaches the pyrolysis zone.

Regarding new independent claim 5400:

The Tsai reference teaches a method for treating a coal formation in situ comprising providing heat from one or more heaters to a portion of the formation; allowing heat to transfer, and producing a mixture as called for in claim 5400. Although the Tsai reference fails to explicitly disclose the atomic hydrogen weight percentage

Art Unit: 3673

greater than about 4%; this is inherent feature of bituminous coal (bituminous coal is taught in col. 1, line 7 of Tsai, et al.) as shown in table 2.5 and figure 2.9 of "Coalbed Methane".

With regards to claim 5401; the hydrogen weight percentage of a portion of the hydrocarbons (since "portion" is apparently a subset of "some") would also be inherent.

With regards to claim 5403; the Tsai reference teaches a pyrolysis temperature range within a section of the formation (see col. 4, line 54).

With regards to claim 5404; the Tsai reference teaches a natural distributed combustor (see col. 2, line 32).

With regards to claim 5408, the Tsai reference teaches the pressure greater than 2.0 bar.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 3673

7. Claims 1609, 1611, 1612, 1619-1631, 1635, 1636, 1648, 1650, 1651, 1658-1670, 1674, 1675, 5402, 5409, and 5410 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsai, et al. (U.S. Patent number 4,299,285).

With regards to claims 1609, 1648, and 5402; the Tsai reference fails to explicitly teach the superposition of heaters. It is apparent that one of ordinary skill in the art would know that the heat sources should be spaced to substantially heat the entire formation. Any configuration of heaters that provides heat to the entire formation would inherently cause superposition of heat, (this is shown by Van Meurs, et al. '118); thus it would have been obvious to one of ordinary skill in the art at the time of the invention to have further modified the Tsai method to have included superposition of heat as called for in claims 1609, 1648, and 5402; in order to ensure that the entire formation is heated.

With regards to claims 1611 and 1650, electrical heaters are well known to heat air. It would have been obvious to one of ordinary skill in the art at the time of the invention to have used an electrical heater with the Tsai process as called for in claims 1611 and 1650, in order to heat the air.

With regards to claims 1612 and 1651, surface burners are well known to heat air. It would have been obvious to one of ordinary skill in the art at the time of the invention to have used a surface burner with the Tsai process as called for in claims 1612 and 1651, in order to heat the air.

With regards to claims 1619 and 1658; the Tsai reference does not teach the thermal conductivity; however, it would have been further obvious to one of ordinary skill

Art Unit: 3673

in the art at the time of the invention to have practiced the Tsai method in a coal seam having a thermal conductivity of greater than about $0.5\text{W}/(\text{m}^\circ\text{C})$ as called for in claims 1619 and 1658; such a formation would be a desirable choice because it would heat more uniformly.

With regards to claims 1620-1631, 1635, 1636, 1658-1670, 1674, 1675, 5409, and 5410; the nature of hydrocarbons produced from such heating is highly variable, and dependent upon many factors, not least of which is the characteristics of the coal. The components of the produced mixture are deemed to be the results of design variables, including coal characteristics and temperature.

8. Claims 1615, 1654, and 5405 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsai in view of Elkins (U.S. Patent number 2,734,579).

The Tsai reference fails to teach the controlling the temperature and pressure wherein the temperature is controlled as a function of the pressure or the pressure is controlled as a function of the temperature.

Elkins teaches controlling the pressure in order to lower the temperature (col. 3, line 46); this is done in order to help prevent overheating. It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the Tsai process to have included the temperature is controlled as a function of the pressure or the pressure is controlled as a function of the temperature as called for in claims 1615, 1654 and 5405 as taught by Elkins, in order to prevent overheating.

Art Unit: 3673

9. Claims 1616, 1617, 1655, 1656, 5406, and 5407 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsai in view of Kasevich, et al. (U.S. Patent number 4,457,365).

The Tsai reference fails to teach the heating rate. With regards to claims 1617, 1656, and 5406; it is known to heat at rates of less than 10°C per day, as shown by Kasevich (figure 3). It is apparent that this low heating rate is desirable because it results in more uniform heating, and reduces the possibility of hot spots. It would have been obvious to one of ordinary skill in the art at the time of the invention to have further modified the Tsai method to have included heating at a rate of less than about 10°C per day as called for in claims 1617, 1656, and 5406 in order to achieve more uniform heating. The claim limitations drawn to the heating energy are nothing more than well known thermodynamic equations.

With regards to claims 1616, 1655, and 5407; it is noted that Kasevich teaches an average of approximately 1.6°/day. It is apparent that when the temperature reaches its highest point (the point at which pyrolysis occurs) the rate of increase would be at the slowest; thus it would be less than about 1°C/day. It would have been further obvious to one of ordinary skill in the art at the time of the invention to have further modified the Tsai method to have included heating at less than about 1°C/day during pyrolysis as called for in claims 1616, 1655, and 5407; in order to achieve more uniform heating.

Art Unit: 3673

10. Claims 1632, 1633, 1671, 1672 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsai, et al. in view of Stoddard, et al. (U.S. Patent number 4,463,807).

The Tsai reference fails to explicitly teach the ammonia.

It is well known that ammonia is a byproduct of such heating of coal. This is taught by Stoddard. It is readily apparent that the amount of ammonia is dependent on many design factors, including the formation characteristics (hydrocarbon content, etc.). It would have been obvious to one of ordinary skill in the art at the time of the invention to have practiced the Tsai method, as modified, in a formation with characteristics allowing greater than 0.05% of the produced mixture to be ammonia, as called for in claims 1632, 1671.

With regards to claims 1633, 1672; it is well known that one of the chief uses for ammonia is fertilizer; thus it would have been further obvious to one of ordinary skill in the art at the time of the invention to have used ammonia produced from the coal seam for fertilizer as called for in claims 1633, 1672.

11. Claims 1637-1640, 1676-1679 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsai, et al. in view of Gregoli, et al. (U.S. Patent number 6,016,867).

The Tsai reference fails to teach the altering pressure to inhibit production of hydrocarbons having carbon numbers greater than about 25. The Gregoli reference teaches that in a similar in-situ processes, it is beneficial to use high pressure to break heavy hydrocarbons. It is well known that carbons having carbon numbers greater than about 25 are considered to be heavy; and impede production because they are dense

Art Unit: 3673

and viscous. It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the Tsai method to have included altering pressure to inhibit production of hydrocarbons having carbon numbers greater than about 25, as called for in claim 1637, in order to improve production.

The Tsai reference fails to teach the recirculating hydrogen, providing hydrogen, or hydrogenating. The Gregoli reference teaches that in a similar in-situ processes, it is beneficial to use hydrogen to hydrogenate heavy hydrocarbons. It is well known that carbons having carbon numbers greater than about 25 are considered to be heavy; and impede production because they are dense and viscous. It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the Tsai method to have included recirculating hydrogen as called for in claim 1638; providing hydrogen as called for in claim 1639; and hydrogenating as called for in claim 1640; in order to reduce the heavy hydrocarbons and to improve production.

12. Claim 1644, 1645, 1683, 1684, 5396, 5397, 5411, and 5412 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsai, et al. (U.S. Patent number 4,299,285) in view of Van Meurs, et al. (U.S. Patent number 4,886,118).

The Tsai reference fails to teach the at least about 7 heaters for each production well. Note that Tsai teaches: "*the principles are applicable to a multiple of interrelated injection and production wells*" (col. 2, line 8).

The Van Meurs reference teaches a similar in situ heating system, and further teaches that six or twelve heat sources for each production well significantly increases the production (col. 8, line 24).

Art Unit: 3673

It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the Tsai method to have included at least about 7 heaters disposed in the formation for each production well, as called for in claims 1644, 1683, and 5411 in order to improve production.

With regards to claims 1645, 1684; the Van Meurs reference teaches the heaters surrounding the production well; since this includes at least 3 heaters this inherently includes a triangle. It would have been further obvious to one of ordinary skill in the art at the time of the invention to have further modified the Tsai method to have included at least 3 sources in a triangle as called for in claim 1645, 1684 in order to increase production.

With regards to claims 5396 and 5397; is apparent that the number of heaters is largely a matter of engineering design. It would have been obvious to one of ordinary skill in the art at the time of the invention to have used at least about 20 heaters for each production well, as called for in claims 5396, 5397, and 5412 based on the desired heating rate and formation heat transmission characteristics.

13. Claims 1646 and 1685 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsai, et al. in view Salomonsson (U.S. Patent number 2,914,309).

The Tsai reference teaches all of the limitations of claims 1608 and 1647, from which these claims depend, but fails to explicitly teach the three or more heaters in a triangular pattern and the plurality of units in a repetitive pattern. Note that Tsai

Art Unit: 3673

teaches: *"the principles are applicable to a multiple of interrelated injection and production wells"* (col. 2, line 8).

Salomonsson shows at least three heaters for each production well , and further teaches that it is desirable to have a repetitive pattern in order to cover the area evenly. It is apparent that this is beneficial in order to prevent hot spots.

It would have been obvious to one of ordinary skill in the art at the time of the invention to have further modified the Tsai method to have included a unit of a triangular pattern and a repetitive pattern of units as called for in claims 1646 and 1685; in order to cover the area evenly.

Response to Arguments

14. Applicant's arguments filed 10/31/02 have been fully considered but they are not persuasive.

With regards to independent claims 1608 and 1647, applicant has argued that the Tsai reference fails to teach or suggest "providing heat from one or more heaters to at least a portion of the formation". Applicant also provides text from the specification to support a definition of "heater", which would exclude the fire taught by Tsai.

It is noted that applicant's specification also includes much broader definitions of "heater", which include fire:

"Combustion of a fuel may be used to heat a formation. Combusting a fuel to heat a formation may be more economical than using electricity to heat a formation. Several different types of heaters may use fuel combustion as a heat source that heats a formation. The combustion may take place in the formation, in a well and/or near the surface. Combustion in the formation may be a fireflood."

(page 3, lines 20-28)

Art Unit: 3673

Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Regarding claims 1610 and 1649; a temperature within this range is shown by Tsai (col. 3, line 42).

Regarding claims 1613, 1614, 1652, and 1653; applicant has not provided arguments to show how the Tsai heater differs from the claimed natural distributed combustor or flameless combustor.

With regards to claim 1618 and 1657; it is noted that the claim broadly calls for "comprises transferring heat substantially by conduction" (emphasis added). It should be abundantly clear that heat transfer in a solid substance such as coal inherently includes conduction.

With regards to claims 1634 and 1673; 50 psi and 500psi are both significantly greater than 2 bar.

With regards to claims 1641, 1642, 1680 and 1681; applicant has failed to provide any evidence that the uniform increase of permeability is not inherent.

With regards to claims 1643 and 1682; applicant has not shown any evidence that the volatile content of coal is the same as the yield. Note that since the volatile content is reported along with ash content, it clearly cannot be equated to yield.

With regards to claims 1609, 1648, 1611, 1650, 1612, 1651, 1619, 1658, 1632, 1633, 1671, 1672, 1646, and 1685; applicant's statements that "The features of claim ###, in

Art Unit: 3673

combination with the features of independent claims 1608 and 1646 respectively, do not appear to be taught or suggested by the cited art.” are not at all persuasive.

With specific regards to claims 1619 and 1658, and applicant’s request for a reference (as per MPEP 2144.03); attention is drawn to the attached pages from “Coal: Typology-Physics-Chemistry-Constitution”; which show that such a thermal conductivity is commonplace in coal.

With regards to claims 1620-1631, 1635, 1636, 1658-1670, 1674, and 1675; applicant’s argument is not persuasive. Applicant has failed to provide evidence that these products would not be inherently produced by the Tsai process.

With regards to claim 1615 and 1654; Elkins explicitly teaches “decreasing the injection gas pressure also decreases the combustion zone temperature” (col. 3, line 46).

Applicant’s own specification discloses:

“In an alternative embodiment, a fluid (e.g., liquid or gas) may be injected in the innermost row of wells, allowing a selected pressure to be maintained in or about the pyrolysis zone.”(emphasis added)

Applicant’s arguments that the controlling of injection pressure taught by Elkins does not meet the claimed limitation are therefore not persuasive.

With regards to claims 1616, 1617, 1655, and 1656; Kasevich inherently teaches that the rate of increase of temperature stops (e.g. at the disclosed maximum temperatures—col. 15 line 65 through col. 16, line 11) since the increase of temperature stops, the heating must inherently comprise a rate of increase less than 1.6°C. With regards to applicant’s further arguments concerning the Kasevich

Art Unit: 3673

reference; the claims do not call for "using a desired heating rate to calculate a maximum amount of heating". Kasevich clearly teaches the slow heating rate. With regards to applicant's arguments that the proposed modification would change the principle of operation of the Tsai method; it is apparent that the Tsai method and Kasevich method could be used complementarily, e.g. using Tsai's hot air injection to increase permeability along with Kasevich's electric heating.

With regards to claims 1632, 1633, 1671, and 1672; applicant's arguments that Stoddard fails to teach the 0.05% ammonia are misplaced---the rejection is that the percent ammonia would be obvious based on design factors, including formation characteristics.

Applicant's arguments concerning the Gregoli reference and claims 1637-1640 and 1676-1679 are not persuasive. Applicant's assertion that the Gregoli process of converting high molecular weight hydrocarbons (e.g. greater than 25 carbon number) into lower weight does not anticipate "to inhibit production... having carbon numbers greater than about 25" is simply not persuasive. Applicant's further assertions concerning the providing hydrogen are clearly contradicted by figure 1 of Gregoli. Applicant's invitation to provide evidence (as per MPEP 2143.01) is apparently misplaced: the rejection is not based on "matters of choice or design" as asserted by applicant.

Applicant's arguments concerning the Van Meurs reference (claims 1644, 1645, 1683, and 1684) are not persuasive. Van Meurs clearly teaches that the production rate

Art Unit: 3673

can be increased by increasing the number of heater wells. See column 8, second paragraph

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Kreck whose telephone number is (703)308-2725. The examiner can normally be reached on 6:30-3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Heather Shackelford can be reached on (703)308-2978. The fax phone numbers for the organization where this application or proceeding is assigned are

Art Unit: 3673

(703)305-3597 for regular communications and (703)305-7687 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)306-4177.

JJK

January 13, 2003

George Suchfield
George Suchfield
Primary Examiner